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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,614	11/21/2003	Duck-Chul Hwang	51089/DBP/Y35	3144
23363	7590	08/30/2006	EXAMINER	
CHRISTIE, PARKER & HALE, LLP			CHU, HELEN OK	
PO BOX 7068			ART UNIT	PAPER NUMBER
PASADENA, CA 91109-7068			1745	

DATE MAILED: 08/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/719,614	Applicant(s) HWANG, DUCK-CHUL	
	Examiner Helen O. Chu	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 27 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-22 and 24-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-22 and 24-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's Arguments/Remarks filed on June 26, 2006 have been received.

Claims 1-15 are withdrawn. Claims 16, 17, 19, 20 and 26 have been amended. Claim 23 is cancelled.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action.

Claim Objections

3. The claim objections on claims 19-20 are withdrawn because the Applicant has amended the claims.

4. The claim objection on claim 26 are withdrawn because the Applicant has amended the claim.

Claim Rejections - 35 USC § 112

5. The rejection under 35 U.S.C 112, second paragraph, on claim 17 is withdrawn because Applicant has amended the claim.

Claim Rejections - 35 USC § 102

6. The rejections under 35 U.S.C 102 (b) as anticipated by Gorkovenko et al. on claims 16-18 and 27-30 are withdrawn because Applicant has amended the claims.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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8. Claims 16-18, 24-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Gorkovenko et al.

In regards to claims 16-18, 24 and 25, Gorkovenko et al. teaches a cathode with electroactive sulfur material in a battery (Title) with conductive filler (Column 5, line 65), a binder (Column 6, Line 5) and an aluminum oxide additive (Column 15, Line 18). The Gorkovenko et al. reference further specifies that the weight ratio of the aluminum oxide to lithium octasulfide of 6.2 to 1 (Column 15, Lines 23-25). Table 1 indicates the specific weight percent of octasulfide in an amount of 2.3. If aluminum oxide is 6.2 times more than octasulfide then the weight percentages of aluminum oxides should be 14.62

In regard to claim 26, the Gorkovenko et al. reference teaches a sulfur base compound consisting of Li_2S_8 (Column 20, Line 62) and a carbon-sulfur polymers of with the formula of $(\text{C}_2\text{S}_z)_n$ where z ranges from 1-100 and n is equal to 2 (Column 13, Lines 44-46)

In regards to claims 27-30, the Gorkovenko et al. reference discloses a coating layer (Column 22, Line 46-47) that comprises a polyethylene oxide, silica, and a conductive carbon (Column 22, 35-40)

Claim Rejections - 35 USC § 103

9. The rejections under 35 U.S.C 103 (a) as anticipated, on claims 19-22 and 23-22, by Gorkovenko et al. as applied to claims 16-18 and 27-30 above, and further in view of Bi et al. are withdrawn because Applicant has amended the claims.

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gorkovenko et al as applied to claims 16-18, 24-30 above, and further in view of Bi et al. (US Patent 5,952,125)

The Gorkovenko et al. reference teaches the elements of claims 16-18, 24-30 above and further incorporated herein. The Gorkovenko et al reference further discloses that cathodes that include metal oxide are beneficial in increasing the energy density (Column 15, Lines 9-13), however, the Gorkovenko et al reference does not disclose a particle size diameter of 5 to 5000nm. However, the Bi et al reference teaches that cathodes with compositions that intercalate lithium for use in a battery are metal oxides. (Column 1, Lines 31-33). Batteries based on metal oxides (vanadium oxide) that are nanoparticles of 5nm 1000nm (Column 1, Lines 42-44) increases energy density compared with larger diameter metal oxide particles (Column 2, Lines 11-19). Therefore, it would have been obvious to one of ordinary skill at the time the invention was made to incorporate metal oxides of 5nm to 1000nm as taught by Bi et al. into the cathode in a lithium-sulfur battery to improve performance characteristics.

Response to Arguments

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12. Applicant's arguments filed June 26, 2006 have been fully considered but they are not persuasive.

The Applicant's principle arguments are:

A) The present invention, the addition of the inorganic additives lowers the surface roughness, thereby decreasing the capacity, the cycle life is increased from 60% to 91%. Górovenko is silent as to the decrease in the surface roughness and the life cycle characteristics that are improved within the amount of the inorganic additive claimed in the present invention, including independent, amended claim 16.

Please consider the following:

A) Applicant misinterpreted in the light of the specification. Although these elements are found as examples or embodiments in the specification, they were not claimed explicitly. Nor were the words that are used in the claims defined in the specification provides no evidence to indicate these that these limitations must be imported into the claims to give meaning to disputed terms. *Constant v. Advanced Micro-Devices Inc.* 7 USPQ2d 1064

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen O. Chu whose telephone number is (571) 272-5162. The examiner can normally be reached on Monday-Friday 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HOC


PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER